

45. The rivet assembly as claimed in claim 1, wherein at least one cutting edge comprises a plurality of cutting edges helically staged along the groove for pulling the auger through the work piece.

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(circled)

REMARKS

By this Amendment, claims 7 and 37 have been cancelled, claims 1, 8, 10-14, 20, 32 and 36 have been amended, and claims 41 through 45 have been added. Support for the new claims is found throughout the specification, drawings and claims as originally filed. No new matter is added. Applicant hereby requests further examination and reconsideration of the application, in view of the foregoing amendments and the remarks that follow.

Claim Rejections - 35 U.S.C. § 102

Claims 1, 2, 4, 13-15, 17-19, 36 and 38-40 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Aasgaard (U.S. Patent No. 5,915,901), hereinafter "Aasgaard '901". The Patent Office noted that the Aasgaard reference does not disclose an auger having a polishing portion in accordance with the present invention. Accordingly, claim 1 has been amended to now recite a mandrel including an auger having . . . "a polishing portion including at least one polishing edge formed by the groove for at least one of deburring and polishing the aperture created by said at least one cutting edge. . . ." Similarly, claim 36 has been amended to now recite a mandrel including an auger having . . . "means for at least one of deburring and polishing the aperture created by said cutting means. . . ." Accordingly it is believed that the rejections of claims 1, 2, 4, 13-15, 17-19, 36 and 38-40 under 35 U.S.C. § 102(b) have been obviated. Withdrawal of the rejections of these claims under 35 U.S.C. § 102(b) is therefore respectfully requested.

Claim Rejections - 35 U.S.C. § 103

Claims 10, 15, 16, 20, 21, 23, 26, 28 and 31-35 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Aasgaard in view of Tisserant (U.S. Patent No. 2,897,696). Claims 3, 5, 7-

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9, 11, 22, 24, 27, 29 and 37 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Aasgaard alone, or as modified by Tisserant as applied to claims 1, 2, 20, 26 and 36, and further in view of Kolb et al. (U.S. Patent No. 4,582,458). Claims 6, 12, 25 and 30 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Aasgaard alone, or as modified by Tisserant and/or Kolb et al. as applied to claims 1, 7, 20 or 29, and further in view of Peterson (U.S. Patent No. 5,915,901). Applicant respectfully traverses these rejections for the following reasons.

To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. MPEP § 2143.03 citing *In re Royka*, 180 USPQ 580 (C.C.P.A. 1974). See also *In re Wilson*, 165 USPQ 494 (C.C.P.A. 1970). None of the references, either alone or in combination, teach or suggest a rivet assembly comprising “a mandrel including an auger having a groove generally longitudinally disposed therein, a cutting portion including at least one cutting edge formed by the groove for incrementally shaving material from the work piece for forming an aperture in the work piece as said mandrel is rotated, and a polishing portion including at least one polishing edge formed by the groove for deburring and polishing the aperture created by said at least one cutting edge” as presently claimed in Claim 1 (and claimed in means plus function form in claim 36), or “a mandrel including an auger having a groove generally longitudinally disposed therein for forming at least one cutting edge and at least one polishing edge; wherein . . . the at least one polishing edge is suitable for deburring polishing the aperture created by said at least one cutting edge as claimed in claim 20.

When applying 35 U.S.C. 103, the following tenets of patent law must be adhered to: (A) the claimed invention must be considered as a whole; (B) the references must be considered as a whole and must suggest the desirability and thus the obviousness of making the combination; (C) the references must be viewed without the benefit of impermissible hindsight vision afforded by the claimed invention; and (D) reasonable expectation of success is the standard with which obviousness is determined. See MPEP § 2141 and *Hodosh v. Block Drug Co., Inc.*, 786 F.2d 1136, 1143 n.5, 220 USPQ 182, 187 n.5 (Fed. Cir. 1986).

As noted by the Patent Office, the primary reference, Aasgaard '901, discloses a rivet

assembly comprising an auger formed on the mandrel of the rivet assembly, but does not disclose an auger or head having a polishing portion including a polishing edge for deburring and polishing the aperture formed by the auger. As a result, the Patent Office relies on the supplemental references, particularly the Tisserant reference, for teaching of a "polishing edge", presently recited in Claim 1 as amended. Applicant respectfully disagrees, and submits that, contrary to the assertions of the Patent Office, neither the Tisserant reference, nor the other supplemental references, Kolb et al. or Peterson, disclose, teach or suggest a rivet assembly comprising a mandrel including an auger or head having a polishing portion including a polishing edge for deburring and polishing the aperture formed by the auger.

The Patent Office asserts that "the groove at the portion labeled 12" illustrated in FIG. 1 of the Tisserant reference forms a polishing edge as claimed by Applicant in Claims 1 and 20. Applicant respectfully disagrees. Nowhere does the Tisserant reference disclose that the "the groove at the portion labeled 12" provides a polishing edge. In fact, nowhere does the Tisserant reference ever claim that the drill bit disclosed therein provides deburring or polishing of the aperture formed. Instead, the Tisserant reference discloses a staged drill bit for drilling holes having different diameters in sheet metal. Thus, unlike the present invention, wherein the auger is inserted completely through the work piece, the Tisserant bit is inserted only to the depth or stage needed to form a hole or aperture having the desired diameter. Moreover, because the groove of the Tisserant bit does not extend completely through the bit at the "portion labeled 12," the bit would bind if inserted to that point due to the accumulation of metal shavings which could not be channeled away from the bit. Consequently, the portion of the Tisserant bit that is asserted to provide a polishing edge, namely, the groove at the "portion labeled 12," would not be inserted into the work piece. Further, if the Tisserant bit was to be used in a rivet assembly, as disclosed by Applicant, such binding would cause premature separation of the mandrel shank from the auger, undesirably preventing insertion of the rivet.

The other supplemental references, Kolb et al and Peterson, fail to make up for this defect in the Tisserant reference since nowhere do these references disclose, teach or suggest a polishing edge

as claimed by Applicant. In fact, the Kolb et al. and Peterson references fail to even address deburring and polishing of apertures formed as their respective bits or fasteners are inserted into a work piece. Instead, the Kolb et al. reference, like the Tisserant reference, discloses a staged drill bit whose cutting edges are stepped (not helically angled) for drilling holes having different diameters in sheet metal. Like the Tisserant bit, the Kolb et al. bit is inserted only to the depth or stage needed to form a hole or aperture having the desired diameter and does not completely penetrate the work piece like auger of the present invention. Similarly, the Peterson reference discloses a self-drilling fastener having a drill tip defined by two concave grooves formed one on each side of the shank of the fastener. (Peterson, abstract). The Patent Office asserts that the groove 25 forms a polishing edge having a curve. However, nowhere does the Peterson reference disclose, teach or suggest that the groove 25, while curved, forms a polishing edge for deburring and polishing the aperture formed.

The Patent Office further asserts that the Tisserant reference discloses an auger having a "self piercing point (at 30)." However, nowhere does the Tisserant reference disclose, teach or suggest an auger having a tip that includes "a point suitable for piercing the work piece, the point extending into an initial contact edge for removing work piece material" as presently claimed. Instead, Tisserant discloses that the tip of the drill bit is provided with a "pilot drill 30." (Tisserant, column 2, line 24).

Finally, the Patent Office has provided no reason, suggestion, or motivation from the prior art for modifying the teaching of the Aasgaard '901, Tisserant, Kolb et al. and Peterson references to achieve Applicant's invention. The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art suggests the desirability of the combination. MPEP § 2143.01. Further, the Patent Office must consider the claimed invention "as a whole" and must put aside knowledge of Applicant's disclosure in reaching a determination of obviousness. MPEP § 2141.02. However, the present rejection contains only assertions by the Patent Office that structures shown in drawings of the cited references may be equated to the polishing edges claimed by Applicant, even though, when read in their entirety, the references do not disclose that the cited structures are used for deburring or polishing an aperture. Consequently, it is

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believed that the Patent Office has impermissibly attempted use the teaching of Applicant's specification to modify the cited references to achieve Applicant's claimed invention, and it is requested that the rejection under 35 U.S.C. § 103 be withdrawn. MPEP § 2142; *In re Zurko*, 111 F.3d 887, 42 USPQ2d 1476 (Fed. Cir. 1997); *In Re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991); *In re Bond*, 910 F.2d 831, 15 USPQ2d 1566 (Fed. Cir. 1990); *In re Laskowski*, 871 F.2d 115, 10 USPQ2d 1397 (Fed. Cir. 1989).

Accordingly, withdrawal of the rejections of all claims under 35 U.S.C. § 103 is therefore respectfully requested.

New Claims

Support for new claims 41-45 is found throughout the specification and drawings as originally filed. In particular, support for new claims 41-45 is found in the specification from paragraph [0019] through paragraph [0029]. No new matter is added.

As argued above, it is believed that independent claim 1 is patentable since neither the cited references, Aasgaard '901, Tisserant, Kolb et al. and Peterson, nor the prior art in general teach or suggest the rivet assembly claimed. Consequently, new claims 41-45, which depends from claim 1, are also believed patentable over the prior art. Moreover, it is believed that none of the cited references disclose, teach or suggest the subject matter claimed in new claims 41-44, when read in conjunction with independent claim 1 and any intermediate claims. Accordingly, allowance of new claims 41-44 is earnestly requested.

Art Made of Record Not Relied On

Applicants will not burden the record with a discussion of art not specifically applied to the claims.

Marked-Up Version of Amendment

Attached hereto is a marked-up version of the changes made to the specification and claims by the current amendment. The attached marked-up version is captioned "***VERSION WITH MARKINGS TO SHOW CHANGES MADE***"

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CONCLUSION

For the above reasons, it is respectfully submitted that the application is now in condition for allowance of all claims therein. Withdrawal of the rejection and issuance of the application as a patent is earnestly solicited.

Respectfully submitted,
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VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS:

Claims 7 and 37 are cancelled, and claims 1, 8, 10-14, 20, 32 and 36 have been amended as follows:

1. (Amended) A rivet assembly, comprising:
a rivet body having a hollow tubular sleeve and an enlarged flattened head suitable for abutting the surface of a work piece; and
a mandrel disposed in said rivet body, the mandrel including an auger having a groove generally longitudinally disposed therein [for forming at least one cutting edge], a cutting portion including at least one cutting edge formed by the groove for incrementally shaving material from the work piece for forming an aperture in the work piece as said mandrel is rotated, and a polishing portion including at least one polishing edge formed by the groove for deburring and polishing the aperture created by said at least one cutting edge,
wherein [the at least one cutting edge is suitable for incrementally shaving material from the work piece as said mandrel is rotated for creating an aperture capable of receiving the hollow tubular sleeve] the aperture formed by the cutting portion and polishing portion receives the hollow tubular sleeve when the rivet body is inserted in the work piece.

7. (Cancelled)

8. (Amended) The rivet assembly as claimed in claim [7]1, wherein the at least one polishing edge comprises a leading polishing edge and a trailing polishing edge formed on opposite sides of the groove.

10. (Amended) The rivet assembly as claimed in claim [7]1, wherein the at least one polishing edge is parallel to a longitudinal axis of the auger.

11. (Amended) The rivet assembly as claimed in claim [7]1, wherein the at least one polishing edge forms an angle with respect a longitudinal axis of the auger.

12. (Amended) The rivet assembly as claimed in claim [7]1, wherein the at least one polishing edge is curved.

14. (Amended) The rivet assembly as claimed in claim 13, wherein the tip includes a point suitable for piercing the work piece, the point extending into [a cutting tooth] initial contact edge for removing work piece material.

20. (Amended) A rivet assembly, comprising:
a rivet body having a hollow tubular sleeve and an enlarged flattened head suitable for abutting the surface of a work piece; and
a mandrel disposed in said rivet body, the mandrel including an auger having a groove generally longitudinally disposed therein for forming at least one cutting edge and at least one polishing edge;
wherein the at least one cutting edge is suitable for incrementally shaving material from the work piece [and] as said mandrel is rotated for creating an aperture capable of receiving the hollow tubular sleeve, and [wherein] the at least one polishing edge is suitable for deburring and polishing the aperture created by said at least one cutting edge.

32. (Amended) The rivet assembly as claimed in claim 31, wherein the tip includes a point suitable for piercing the work piece, the point extending into [a cutting tooth] initial contact edge for removing work piece material.

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36. (Amended) A rivet assembly, comprising:
a rivet body having a hollow tubular sleeve and an enlarged flattened head suitable for abutting the surface of a work piece; and
a mandrel disposed in said rivet body, the mandrel including an auger having a groove generally longitudinally disposed therein, [for forming] means for cutting material from the work piece[,] as the mandrel is rotated for forming an aperture, and means for deburring and polishing the aperture created by said cutting means,
wherein [the cutting means is suitable for incrementally shaving material from the work piece as said mandrel is rotated for creating an aperture capable of receiving the hollow tubular sleeve] the aperture formed by the cutting means and polishing means receives the hollow tubular sleeve when the rivet body is inserted in the work.

37. (Cancelled)